

04645.0875

- 6 -

REMARKS

Claims 1 to 38 are pending. No claims are allowed and claims 18 and 20 to 38 are canceled.

1. The Examiner indicates that claims 1 to 19 drawn to a ruthenium-compound coated substrate constitute a first invention and claims 20 to 38 drawn to a method of coating are drawn to a second invention. The Applicants have canceled claims 20 to 38 of the first invention.

2. The application contains color photographs that will only be accepted upon the filing of a petition under 37 CFR 1.84(a)(2), accompanied by three sets of the photographs. The Applicants request that this requirement be held in abeyance until such time as allowable subject matter is indicated in the claims.

3. Claim 18 is objected to under 37 CFR 1.75(c) as being of improper dependent form. Claim 19 has been canceled with the understanding that the term "ultrasonic" in the remaining claims means frequencies of 20,000 Hz and above.

4. Claims 1 to 4, 7 to 16, 18 and 19 are rejected under 35 USC 102(b) as being anticipated by Tong et al. (U.S. Patent No. 5,464,453). Tong et al. describes a method for fabricating an electrical storage device by coating a high surface area, electrically conducting

04645.0875

- 7 -

material on a support. The porous coating material originates from various precursor solutions applied by any one of a number of techniques including dip coating, spray coating, roll coating, spin coating, doctor blading, electrophoretic deposition and chemical vapor deposition. For spray coating, the deposition process is described as taking place at a temperature up to 150°C by means of an ultrasonic or other spray nozzle with a flow rate of around 0.1 to 5 ml/min. in a carrier gas.

At column 7, lines 1 to 9, the cited Tong et al. patent teaches heating the substrate to a temperature of 0°C to 150°C as the substrate is being contacted with the ultrasonic spray. However, heating to this temperature may not necessarily be sufficient to properly cure the porous coating material on the substrate. The reason Tong et al. heated their substrate to a relatively low temperature is that they were concerned with the alcohol-based system catching fire. As discussed at page 12, lines 11 to 22 of the specification, "While alcohol based solvent systems such as those containing isopropanol, ethanol and butanol are commonly used for creating a solution of a semiconductive or pseudocapacitive compound, they limit the temperature to which the substrate can be heated. For example, isopropanol has a flash point of 53°F. A lower first heating temperature, in turn, affects diffusion of the deposited ions into the structure of the substrate. This ultimately impacts the bonding or adhesive strength of the deposited materials to the substrate."

04645.0875

- 8 -

In order to prove the benefits attributed to an increased heating temperature, the Applicants point to the examples in their application. Examples II and III beginning at the bottom of page 20 are particularly informative in that they describe heating a substrate provided with an ultrasonically deposited coating of a ruthenium-containing oxide compound at a temperature of at least about 250°C provides a superior product with respect to substrate adhesion than that taught by the prior art. Adhesion is known to benefit discharge efficiency. The greater the adhesions of the coating compound to the substrate, the more efficient the electrical transmission from the active material to the conductive substrate. Furthermore, greater adhesion helps to retain structural integrity between the active material and the substrate, even when the component is subjected to binding and folding, as sometimes occurs during fabrication of electrical energy storage devices.

Independent claim 1 has also been amended to set forth that the solvent of Applicants' invention not only does not contain alcohol; it does not contain a halide as well. Further, the solvent has a precursor of a ruthenium-containing oxide compound that is substantially devoid of a halide dissolved therein. As the Examiner points out at page 5 of the office action, Tong et al. teach that one preferred procedure is "dipping the support material into a metal chloride alcohol solution". In the examples, Tong et al. also teach using halide solutions, particularly ones containing ruthenium trichloride.

In the accompanying declaration under 37 CFR 1.132, the Applicants set forth comparative tests of ruthenium oxide coatings derived from respective compounds according to the present invention and the prior art ultrasonically spray deposited on a heated substrate. The comparative tests prove that the use of a precursor of a ruthenium oxide-containing compound substantially devoid of a halide, such as chlorine, results in a significantly improved pseudocapacitive component in comparison to deposition of a ruthenium halide-containing compound.

Therefore, a fair reading of the teachings of the cited Tong et al. patent would have led one skilled in the art to believe that it is beneficial to dissolve a ruthenium halide-containing compound, such as ruthenium trichloride, in an alcohol-based system. The accompanying declaration proves that the resulting ruthenium oxide coated substrate would contain undesirable contaminants that would not make a desirable cathode for an electrolyte capacitor. Accordingly, amended independent claim 1 calling for the solvent as not containing an alcohol and being substantially devoid of a halide is believed to be patentable over Tong et al. and claims 2 to 4, 7 to 16 and 19 are allowable as branching from a patentable base claim. Claim 18 is canceled.

Reconsideration of this rejection is requested.

04645.0875

- 10 -

5. Claims 5 and 19 are rejected under 35 USC 103(a) as being unpatentable over Tong et al. in view of Spitz et al. (U.S. Patent No. 3,840,391). The Tong et al. patent has already been discussed. Spitz et al. teaches a method for the preparation of thin films by ultra-sonically vaporizing solutions into an aerosol. The aerosol is deposited on a substrate for the preparation of thin oxide films that may be employed as photo masks in microelectronics. At column 4, line 28+, an example of the formation of ferric oxide thin films as photo masks is described. This is accomplished by heating an aqueous solution of ferric chloride (FeCl_3) on a substrate at a minimum temperature of 450°C.

However, claims 5 and 19 depend from independent claim 1, which is believed to be patentable in its amended form. For that reason, claims 5 and 19 are allowable as hanging from a patentable base claim.

Reconsideration of this rejection is requested.

6. Claims 6 and 17 are rejected under 35 USC 103(a) as being unpatentable over Tong et al. in view of Evans (U.S. Patent No. 5,369,547). The Tong et al. patent has already been discussed. Evans relates to a capacitor made by heating a titanium substrate to about 85°C. A solution of hydrated ruthenium chloride dissolved in isopropyl alcohol is then sprayed onto the substrate. If desired, a chloride of tantalum is added to the solution. At column 6, lines 27 to 30, Evans admits that the process of their invention is "conventional".

04645.0875

- 11 -

A system containing a halide is detrimental to the final product, as shown in the accompanying declaration. Furthermore, independent claim 1 has been amended to set forth that the solvent does not contain an alcohol. The previous discussion regarding the cited Tong et al. patent relates why the Applicants believe an alcohol-based solvent results in an inferior product.

Therefore, amended independent claim 1 is believed to be patentable over this combination of patent references. Claims 6 and 17 are allowable as hinging from patentable base claims.

Reconsideration of this rejection is requested.

7. Claims 4, 5, 7 to 19, 25 and 26 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 to 11, 15 and 16 of U.S. Patent No. 6,224,985 to Shah et al. Enclosed with this amendment is a terminal disclaimer under 37 CFR 3.73(b) in favor of the Shah et al. patent. The terminal disclaimer is believed to obviate this rejection.

Reconsideration of this rejection is requested.

8. Claims 1, 2 and 18 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 37 and 38 of copending application Serial No. 10/290,598. Enclosed with this amendment is a terminal disclaimer under 37 CFR 3.73(b) in favor of the copending

04645.0875

- 12 -

application. The terminal disclaimer is believed to obviate this rejection.

Reconsideration of this rejection is requested.

It is believed that claims 1 to 7 and 19 are now in condition for allowance. Notice of Allowance is requested.

Respectfully submitted,



Michael F. Scalise
Reg. No. 34,920

Wilson Greatbatch Technologies, Inc.
10,000 Wehrle Drive
Clarence, NY 14031
(716) 759-5810
October 3, 2003